

## WHAT IS CLAIMED IS:

1. An electron beam physical vapor deposition coating apparatus comprising:

a coating chamber at an elevated temperature and a subatmospheric pressure;

a crucible within the coating chamber;

a coating material surrounded by and contained within the crucible, the coating material having a surface exposed by the crucible;

an electron beam gun projecting an electron beam onto the surface of the coating material, the electron beam having a higher intensity at an interface between the surface of the coating material and the crucible than at a central region of the surface of the coating material.

2. An electron beam physical vapor deposition coating apparatus according to claim 1, wherein the intensity at the central region of the surface of the coating material is substantially zero.

3. An electron beam physical vapor deposition coating apparatus according to claim 1, wherein the electron beam is also projected onto a surface portion of the crucible contiguous with the surface of the coating material, the electron beam having a higher intensity on the surface portion of the crucible than at the central region of the surface of the coating material.

4. An electron beam physical vapor deposition coating apparatus according to claim 1, wherein the electron beam forms a beam pattern with a perimeter on the surface portion of the crucible, the electron beam being incident on the surface of the coating material at an oblique angle so as to establish relative to the electron beam gun a proximal point and an oppositely-

disposed distal point at the perimeter of the beam pattern, the beam pattern having a lower intensity at the proximal and distal points than elsewhere at the perimeter of the beam pattern.

5           5. An electron beam physical vapor deposition coating apparatus according to claim 4, wherein the intensity of the beam pattern at the proximal and distal points is about 30% to about 70% less than the intensity elsewhere at the perimeter of the beam pattern.

10           6. An electron beam physical vapor deposition coating apparatus comprising:

          a coating chamber containing a coating material, the coating chamber being at an elevated temperature and a pressure greater than 0.010 mbar;

15           a crucible within the coating chamber;

          a coating material surrounded by and contained within the crucible, the coating material having a surface exposed by the crucible;

20           an electron beam gun projecting an electron beam onto the surface of the coating material and a contiguous surface portion of the crucible, the electron beam forming a beam pattern with a perimeter on the contiguous surface portion of the crucible, the electron beam gun melting the surface of the coating material and  
25           evaporating molten coating material, the electron beam having a higher intensity at an interface between the surface of the coating material and the contiguous surface portion of the crucible than at a central region of the surface of the coating material, the electron beam  
30           being incident on the surface of the coating material at an oblique angle so as to establish relative to the electron beam gun a proximal point and an oppositely-disposed distal point at the perimeter of the beam pattern, the electron beam having a lower intensity at

the proximal and distal points than elsewhere at the perimeter of the beam pattern.

7. An electron beam physical vapor deposition coating apparatus according to claim 6, wherein the intensity at the central region of the surface of the coating material is substantially zero.

8. An electron beam physical vapor deposition coating apparatus according to claim 6, wherein the intensity of the beam pattern at the proximal and distal points is about 30% to about 70% less than elsewhere at the perimeter of the beam pattern.

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